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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/814,168 | 04/01/2004 | Shigemasa Hirooka | 119289 | 7380 |
| 25944 | 7590 | 02/02/2006 | EXAMINER | |
| OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320 | | | EDWARDS, LOREN C | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 3748 | |

DATE MAILED: 02/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/814,168

Applicant(s)

HIROOKA, SHIGEMASA

Examiner

Loren C. Edwards

Art Unit

3748

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>9/7/05; 4/14/04</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been placed in file of record.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 4/14/04 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the examiner is considering the information disclosure statement.
3. The information disclosure statement (IDS) submitted on 9/7/05 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the examiner is considering the information disclosure statement.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato et al. (U.S. Pat. No. 5,852,929) in view of Toyota (EP 1 293 648 A2). Kato discloses a failure diagnosis apparatus for secondary air supplier, which is adapted to detect an anomaly of a component of a secondary air supplier based on a pressure value in a secondary air supply path of the secondary air supplier configured to supply secondary air to upstream of an exhaust emission purifying device of an internal combustion engine (Abstract; Fig. 2; Col. 4, Line 44 – Col. 5, Line 50), the failure diagnosis apparatus comprising a pressure sensor for detecting pressure in the secondary air supply path (Fig. 2, P1 and P2); and failure diagnosing means for diagnosing a failure based on the pressure (Abstract; Col. 6, Lines 4-67). Kato fails to specifically discuss basing the failure of the secondary air supply on a pressure pulsation, and further that the failure diagnosing means varies a determination threshold for detecting presence or absence of pressure pulsation according to the pressure in the secondary air supplier. Toyota discloses a secondary air supply apparatus and method for detecting abnormality that bases the failure of the secondary air supply on pulsation of pressure in the secondary air path (Abstract; Paragraph 9). Toyota also discloses varying the threshold pressure pulsation value for failure determination on the pressure in the secondary air path (Paragraph 17; Fig. 5, Steps 100 and 102). It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the secondary air failure determination method as taught by Toyota in the apparatus of Kato for the advantage of being able to precisely determine which component is contributing to the abnormality of the system (Paragraph 19).

7. In regards to claim 2, the modified Kato, as described above, discloses the failure diagnosis apparatus according to claim 1, and further wherein diagnosing means increases the determination threshold with an increase in the pressure of the secondary air supplier (Kato, Fig. 4; Col. 6, Lines 9-67).

8. In regards to claim 3, the modified Kato, as described above, discloses the failure diagnosis apparatus according to claim 1, and further wherein the failure diagnosing means detects a failure of each component, based on a pressure behavior pattern during secondary air supply and a pressure behavior pattern without secondary air supply (Toyota, Fig. 1-2; Paragraphs 28-29).

9. In regards to claim 4, the modified Kato, as described above, discloses the failure diagnosis apparatus according to claim 1, and further wherein the secondary air supplier comprises an air pump (Toyota, Fig. 1, No. 12) and a switching means (Toyota, Fig. 1, No. 13) disposed downstream of the air pump, wherein the pressure sensor detects the pressure value in the supply path between the switching means and the air pump (Toyota, Paragraph 23).

10. In regards to claim 5, the modified Kato, as described above, discloses a failure diagnosis apparatus for a secondary air supplier, comprising: a secondary air supply path connected to an upstream exhaust path of an emission purifying catalyst disposed on the exhaust path of an internal combustion engine (Kato, Fig. 1, No. 10, 32, and 24); a secondary air supplying means for supplying air through the secondary air supply path onto the exhaust path (Kato, Fig. 1, No. 34); a pressure sensor for detecting pressure in the secondary air supply path (Kato, Fig. 2, P1 and P2); and a failure diagnosing means

for diagnosing a failure of the secondary air supplying means based on the pressure detected by the pressure sensor (Kato, Abstract), wherein the failure diagnosing means varies a determination threshold according to the pressure detected by the pressure sensor (Toyota, Paragraph 17; Fig. 5, Steps 100 and 102), determines whether a pressure pulsation exists or not based on the pressure and the determination threshold, and makes a failure diagnosis based on the presence or absence of pressure pulsation (Toyota, Abstract; Paragraph 9).

11. In regards to claim 6, the modified Kato, as described above, discloses the failure diagnosis apparatus according to claim 5, and further wherein the failure diagnosing means varies the determination threshold according to an average or smoothed value of the pressure detected by the pressure sensor, and determines whether the pressure pulsation exists or not based on the determination threshold and a sum of the average or smoothed values (Toyota, Paragraphs 17 and 34-35; Fig. 5, Steps 100 and 102).

12. In regards to claim 7, the modified Kato, as described above, discloses the failure diagnosis apparatus according to claim 5, and further wherein the failure diagnosing means determines the determination threshold based on the pressure detected by the pressure sensor and determines whether the pressure pulsation exists or not based on the determination threshold and a sum concerning the detected pressure (Toyota, Paragraphs 17 and 34-35; Fig. 5, Steps 100 and 102).

13. In regards to claims 8 and 9, the modified Kato, as described above, discloses the failure diagnosis apparatus according to claim 7, but fails to specifically discuss the sum being a sum of *absolute* values of differences between measured value and

smoothed value of the detected pressure, or being a sum of lengths of loci of the detected pressure. At the time the invention was made, it would have been an obvious matter of design choice to a person having ordinary skill in the art to sum the absolute values, or the lengths of loci because Applicant has not disclosed that adding the absolute values or lengths of loci provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected the modified Kato apparatus, and Applicant's invention, to perform equally well with either summation because the result is used with a predetermined value which could be adjusted to allow for any type of output from a sensor. Therefore, it would have been obvious to modify Kato to obtain the invention as specified in claim 8 because such a modification would have been considered a mere design consideration which fails to patentably distinguish over the prior art of Kato.

14. In regards to claim 10, the modified Kato, as described above, discloses the failure diagnosis apparatus according to claim 6, and further comprising a pump as the secondary air supplying means on the secondary air supply path (Toyota, Fig. 1, No. 12), and a switching valve downstream of the pump (Toyota, Fig. 1, No. 13), wherein the pressure sensor detects the pressure between the pump and the switch valve (Toyota, Paragraph 23).

15. In regards to claim 11, the modified Kato, as described above, discloses the failure diagnosis apparatus according to claim 10, and further wherein the pressure sensor detects the pressure both with and without a secondary air supply by the secondary air supplying means, and wherein the failure diagnosing means specifies a

failure part based on the detected pressures with and without the secondary air supply (Toyota, Fig. 1-2; Paragraphs 28-29).

16. In regards to claim 12, the modified Kato, as described above, discloses the failure diagnosis apparatus according to claim 6, and further wherein after determining that there is a pressure pulsation, the failure diagnosing means determines whether the pressure pulsation is one due to exhaust pulsation, based on the magnitude of the detected pressure (Toyota, Paragraphs 27-29).

17. In regards to claim 13, the modified Kato, as described above, discloses the failure diagnosis apparatus according to claim 6, and further wherein the pressure sensor detects the pressure both with and without a secondary air supply by the secondary air supplying means, and wherein the failure diagnosing means classifies pressure variations both with and without the secondary air supply into preset pressure behavior patterns and makes a failure diagnosis based on a combination of the pressure behavior pattern with the secondary air supply and the pressure behavior pattern without the secondary air supply (Toyota, Paragraphs 27-29).

18. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kato as applied to claim 6 above, and further in view of Cullen (U.S. Pat. No. 5,832,721). The modified Kato discloses the failure diagnosis apparatus of claim 6, described above, but fails to specifically discuss further comprising supplied air quantity estimating means for estimating a quantity of secondary supply air based on the detected pressure. Cullen discloses an exhaust system with a secondary air supply that has the ability to calculate airflow amount based on pressure sensor signals (Col. 2, Lines 45-65). It would have

Art Unit: 3748

been obvious to one having ordinary skill in the art at the time the invention was made to utilize the airflow calculation method as taught by Cullen in the system of Kato for the advantage of not needing extra sensors to determine the secondary airflow quantity.

Conclusion

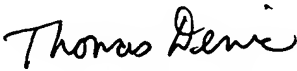
19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hirooka et al. (U.S. Pub. No. 2003/0101716 A1) discloses an auxiliary air supplying system, and control methods and failure diagnostic for a secondary air system. Mizoguchi (U.S. Pat. No. 6,393,833) discloses an abnormality test method and apparatus for secondary air supply. Itoh (U.S. Pat. No. 5,333,446) discloses a diagnostic system for a secondary air supplier in an engine. Kayanuma et al (U.S. Pat. No. 5,119,631) discloses an apparatus and method for detecting abnormalities in a secondary air supplier.

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Loren C. Edwards whose telephone number is (571) 272-2765. The examiner can normally be reached on M-TH 5:30-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (571)272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3748

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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